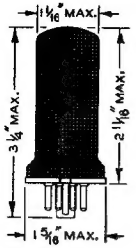
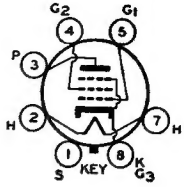


RCA-6F6

POWER-AMPLIFIER PENTODE



The 6F6 is a heater-cathode power-amplifier pentode of the All-Metal type for use in the audio-output stage of a-c receivers. It is capable of giving large power output with a relatively small input voltage. Because of the heater-cathode construction, uniformly low hum-level is attainable in power-amplifier design.

CHARACTERISTICS

Heater Voltage (A. C. or D. C.)	6.3	Volts
Heater Current	0.7	Ampere
Base	Small Wafer Octal 7-Pin	

As Single-Tube Class A_1 Amplifier—Pentode Connection

Plate Voltage	250	315* *max.*	Volts
Screen Voltage (Grid No. 2)	250	315* *max.*	Volts
Grid Voltage (Grid No. 1)	−16.5	−22	Volts
Plate Current	34	42	Milliamperes
Screen Current	6.5	8	Milliamperes
Plate Resistance (Approximate)	80000	75000	Ohms
Amplification Factor (Approx.)	200	200	
Transconductance	2500	2650	Micromhos
Load Resistance	7000	7000	Ohms
Total Harmonic Distortion	7	7	Per cent
Power Output	3	5	Watts

As Single-Tube Class A_1 Amplifier—Triode Connection
(Screen tied to plate)

Plate Voltage†	250	Volts
Grid Voltage	−20	Volts
Plate Current	31	Milliamperes
Plate Resistance	2600	Ohms
Amplification Factor	7	
Transconductance	2700	Micromhos
Load Resistance	4000	Ohms
Total Harmonic Distortion	5	Per cent
Power Output	0.85	Watt

Under the above maximum voltage conditions, transformer or impedance input-coupling devices are recommended. If resistance-coupling is used, refer to last paragraph of APPLICATION.

* Not recommended for automobile service or other similar services where heater voltage can rise more than 10% above rated value.

† Maximum plate voltage=315 volts.

As Push-Pull Class AB_2 Amplifier—Pentode Connection

Unless otherwise specified, values are for two tubes.

	Fixed Bias	*Self-Bias*	
Plate Voltage	375 *max.*	375 *max.*	Volts
Screen Voltage	250 *max.*	250 *max.*	Volts
Grid Voltage	−26 *min.*	—	Volts
Self-Bias Resistor	—	340 *min.*	Ohms
Peak A-F Grid-to-Grid Voltage	82	94	Volts

ZERO-SIGNAL PLATE CURRENT	34	54	Milliamperes
ZERO-SIGNAL SCREEN CURRENT	5	8	Milliamperes
LOAD RESISTANCE (Per Tube)	2500	2500	Ohms
EFFECTIVE LOAD RESISTANCE (Plate-to-plate)	10000	10000	Ohms
TOTAL HARMONIC DISTORTION	5	5	Per cent
POWER OUTPUT (Approx.)	19*	19†	Watts

Under the above maximum voltage conditions, transformer or impedance input-coupling devices must be used.

* With one triode-connected 6F6 as driver operated at plate volts of 250, grid volts of −20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 3.32. The plate, screen and grid supply have negligible resistance.

† With one triode-connected 6F6 as driver operated at plate volts of 250, grid volts of −20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 2.5. The plate and screen supply have negligible resistance. The value given for the self-bias resistor is determined for a minimum grid bias of −21 volts.

As Push-Pull Class AB_2 Amplifier—Triode Connection

(Screen tied to plate)

Unless otherwise specified, values are for two tubes.

	Fixed Bias	*Self-Bias*	
PLATE VOLTAGE	350 *max.*	350 *max.*	Volts
GRID VOLTAGE	−38	—	Volts
SELF-BIAS RESISTOR	—	730 *min.*	Ohms
PEAK A-F GRID-TO-GRID VOLTAGE	123	132	Volts
ZERO-SIGNAL PLATE CURRENT	45	50	Milliamperes
LOAD RESISTANCE (Per Tube)	1500	2500	Ohms
EFFECTIVE LOAD RESISTANCE (Plate-to-plate)	6000	10000	Ohms
TOTAL HARMONIC DISTORTION	7	7	Per cent
POWER OUTPUT (Approx.)	18°	14‡	Watts

Under the above maximum voltage conditions, transformer or impedance input-coupling devices must be used.

° With one triode-connected 6F6 as driver operated at plate volts of 250, grid volts of −20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 1.67. The plate and grid supply have negligible resistance.

‡ With one triode-connected 6F6 as driver operated at plate volts of 250, grid volts of −20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 1.29. The plate supply has negligible resistance. The value given for the self-bias resistor is determined for a minimum grid bias of −36.5 volts.

INSTALLATION

The **base** pins of the 6F6 fit the standard octal socket which may be installed to hold the tube in any position.

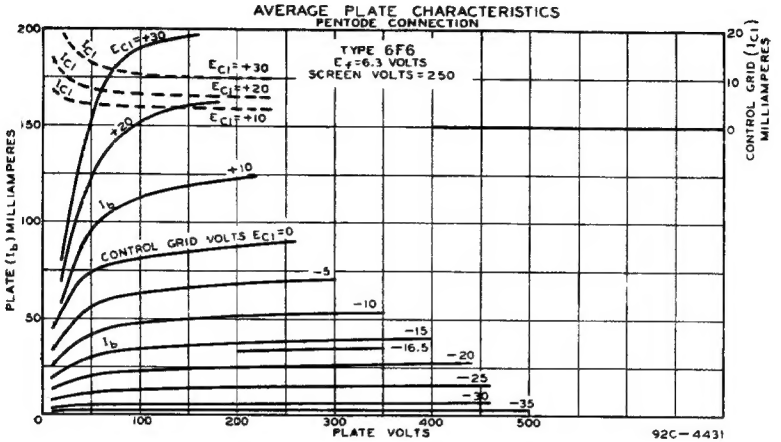
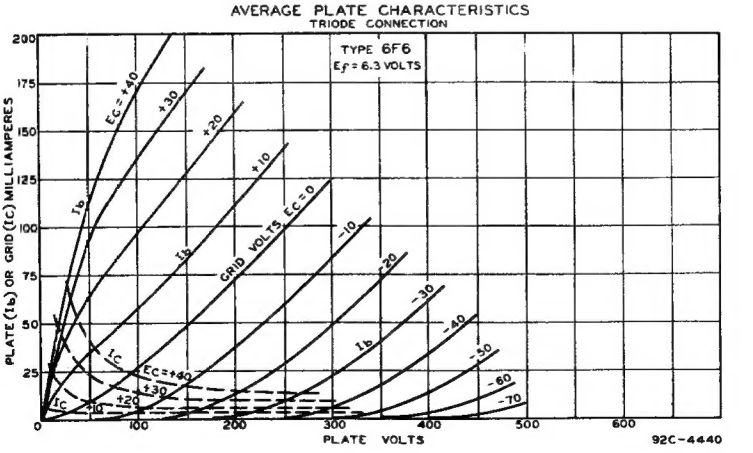
For **heater** operation and **cathode** connection, refer to type 42.

APPLICATION

As a **Class A power-amplifier pentode,** the 6F6 may be used either singly or in push-pull. Recommended operating conditions are given under CHARACTERISTICS. If a single 6F6 is operated at a plate voltage of 250 volts, the self-bias resistor should have a value of approximately 410 ohms; at 315 volts, 440 ohms. For two tubes in the same stage, the value of the self-bias resistor should be approximately one-half that for a single tube.

As a **Class A power-amplifier triode,** the 6F6 may be used either singly or in push-pull. For this service the screen is connected to the plate. Recommended operating conditions are given under CHARACTERISTICS. When a single 6F6 is operated as a Class A triode at a plate voltage of 250 volts, the self-bias resistor should have a value of approximately 650 ohms. For two tubes in the same stage, the value of the self-bias resistor should be approximately one-half that for a single tube.

As a **Class AB power-amplifier triode or pentode,** the 6F6 should be operated as shown under the CHARACTERISTICS. The values shown cover operation with fixed-bias and with self-bias, and have been determined on the basis of some

grid-current flow during the most positive swing of the input signal and of cancellation of second-harmonic distortion by virtue of the push-pull circuit.

The type of input coupling used should not introduce too much resistance in the grid circuit. Transformer- or impedance-coupling devices are recommended. When the grid circuit has a resistance not higher than 0.05 megohm, fixed bias may be used; for higher values, self-bias is required. With self-bias, the grid circuit may have a resistance as high as, but not greater than, 0.5 megohm provided the heater voltage is not allowed to rise more than 10% above rated value under any condition of operation.